

Non-Technical Summary

Nozdrzec Wind Farm Project,
Poland



Introduction

Wind Energia Sp. z o.o., (the Sponsor, the Client), the Special Purpose Vehicle established by the leading developers of renewable energy facilities and operators (CERAC and YVS), is developing a wind farm investment - Nozdrzec Wind Farm (Nozdrzec WF or the Project). The Project will comprise of 18 wind turbine generators (WTGs) and auxiliary infrastructure of access roads, underground, medium voltage (MV) power transmission cables and steering lines, main transforming substation (MTS) and high voltage (HV) overhead PTL as a connector to the national power grid. In the first phase 16 WTGs will be constructed, the remaining two will be developed after additional connection agreement will be concluded with the distribution service operator.

The Project is fully permitted and ready for construction and further operation. The total installed capacity will be 54 MW, although for the time being the agreement with the grid operator allows for 48 MW. The Company intends to re-negotiate the agreement to cover all installed capacity. In the meantime, the Project will need to reduce power production in good windy conditions in order not to exceed the agreed limit.

The aim of this non-technical summary is to summarize the Project and provide information on the various stages of development, including cumulative assessments of the planned wind farm development, to enable meaningful public and stakeholder's engagement process.

What is a Wind Farm?

A wind farm is an energy generation facility which turns the kinematic energy of wind into electrical energy. A typical wind farm consists of:

- Wind turbine generators (WTGs) and relevant technical infrastructure of steering and MV underground lines;
- Internal roads and maneuvering areas;
- Assembly and storage yards;
- Main electrical substation (MES), and
- Either underground or overhead HV PTL (seldom generated electrical energy is evacuated to a power grid via medium-voltage PTLs).

Wind Turbine Description

A typical wind turbine consists of a tower and a nacelle comprising a rotor and measurement apparatus. The rotor is composed of the blades and an axle, attached to each other by a bearing. The blades are moved by the wind and transmit this force to the bearing, which is connected to a multiplier that increases the axle speed. Mechanical energy is transferred from the multiplier to an electricity generator, which transforms it into electricity for subsequent injection into the grid. In modern WTGs, generated electrical energy is transformed to medium voltage by a transformer installed inside the tower, and then is evacuated to a MES or directly to the national power grid.

In order to optimize the energy generation, WTGs are equipped with control systems which place the rotor in optimum position towards wind direction or turn them off in case of too small or too high wind speed. Such systems require some energy to be supplied to a WTG. The control system also monitor performance of WTGs and automatically shut them off in case of abnormal situations, such as e.g. detection of malfunction or fire. Depending on WTG type, the control system



Figure 1. Nordex Wind Turbine Generator (source: www.nordex-online.com)

also detects presence of ice on the blades or turn anti-freezing system hence reduce a risk of ice throw and related damages to humans or goods.

The WTGs do not require any physical presence of personnel to operate. WTGs are managed centrally from the steering center which may be even thousands of kilometers distant from a wind farm.

At the Nozdrzec WF 18 WTGs will be installed, type Nordex N117/3000 (3.0 MW), of the following parameters:

- Hub height: 131.6 m;
- Total height: 190 m;
- Rotor diameter: 116.8 m, and
- Nominal capacity: 3 MW.

General Project Presentation

The Investor

The Company will adopt experience of its owners in development, construction and operation of renewable energy facilities, including three successfully built and operated wind farms in Poland.

The Company is committed to guide the business activity in accordance with the sustainable development principles, including among others:

- Efficient use of resources, including the development of cleaner and more efficient energy technology and development of energy generation means, based on renewable sources;
- Environmental protection with minimization of the environmental impacts of all business activities and participation in initiatives that contribute to the conservation of the environment;
- Minimization and effective management of social impacts, and
- Support development of local communities.

Do We Really Need the Project?

Although there are some people who question global climate change, the recent phenomena observed around the globe, including extremally dry seasons or heavy and catastrophic rain falls in some areas, as well as continuously growing average globe temperature which results with some melting of ice at the poles and mountain glaciers are obvious indicators of human negative impact on climate which needs immediate actions for the sake of future generations. Development of renewable energy sources is one of the measures to reduce human impact on climate.

The Project is expected to displace emissions related to production of the same electrical energy generation by a conventional power plant or combined power and heat plants (in Poland mainly fueled with either hard coal or lignite) with no emission at all. Given the expected annual production of electricity by the Project is 149,300 MWh, implementation of the Project will allow for the following emission savings:

- between 104,211 and 111,229 tons/a of CO₂;
- between 76 and 81 tons/a of SO₂;
- between 78 and 83 tons/a of NO_x;
- between 30 and 32 tons/a of CO, and
- 4 tons/a of particulate matter.

The Project will also increase the renewable energy use in total energy consumption hence will help in achieving 55% carbon emission reduction by 2030, as per EU "Fit for 55" legislative package. It must be also pointed out, that due to

consequences of Russian aggression on Ukraine, in particular shortage of fossil fuels and their high prices, development of renewable energy sources has direct impact on socio-economic situation of Polish industries and households.

The Project has direct socio-economic impacts on development of the communes where it is located, as well as local inhabitants. The Project will generate the following environmental and social benefits:

- The Project will increase the Nozdrzec and Dynów communes incomes, due to the taxes paid by the Company, the additional income of Nozdrzec commune will be approximately PLN 2 million, while the overall income for 2021 was approximately PLN 4 million;
- The landowners of plots occupied by WTGs and supporting infrastructure will benefit from land lease and easement contracts which will at least compensate limitations in land use, and
- During construction phase of the Project new working places will likely be created, which will help local economy. Also during operation the Company will de-snowing companies, hence will positively influence local economy.

Project Location

The Project is located at the territory of two communes – Nozdrzec and Dynów, Rzeszów and Brzozów counties respectively, Podkarpackie voivodeship, southeastern Poland. The WTGs will be sited at the territory of Nozdrzec commune only, in the area delineated by the villages of Barycz (northwestern corner), Łubno (eastern corner), Nozdrzec and Hładno (southeastern corner), Izdebki (southern corner), Różanka and Golcowa (southwestern corner). For the Project site there are valid and binding Local Zoning Plans adopted by Nozdrzec commune municipal council, which allow for construction of a wind farm and its auxiliary infrastructure, including high-voltage overhead PTL. An independent environmental consultant (Ramboll Environ Poland Sp. z o.o., further referred to as Ramboll) confirmed that the Project is compliant with these Local Zoning Plans.

The Project site has a rural character. The terrain is very diverse (terrain altitudes vary between 240 m and 464 m above sea level), in majority occupied by arable fields, pastures, barrow land and in some extent by forest complexes. There is a network of local asphalt roads connecting villages in the area and poorly developed network of dirt roads, with additional need of significant development for the purpose of WF construction and then maintenance. The Project is located outside major and dense forest complexes, marshy areas or environmentally protected areas.

From the geographical perspective the Project is located within the macro-region of the Środkowobeskidzkie Foothills, within the mesoregion of the Dynowskie Foothills. From the west, the Dynowskie Foothills are bordered by the Wisłok river valley (with Strzyżowskie Foothills beyond), and from the east by the San river valley (with Przemyskie Foothills beyond). In the north it neighbors the Sandomierz Basin and Roztocze Highland. In the south, it borders with the Jasielsko-Sanocka Basin, the Bukowskie Hills and the San valley. River valleys show diversified cross-sections transverse. The upper sections are typically erosive, V-shaped, and the lower sections are filled with alluvial sediments 10 m thick. The slopes of the valleys are steep and cut with smaller side valleys.

The Project layout and location against protected areas are presented on Figures 2, 3 and 4 respectively.

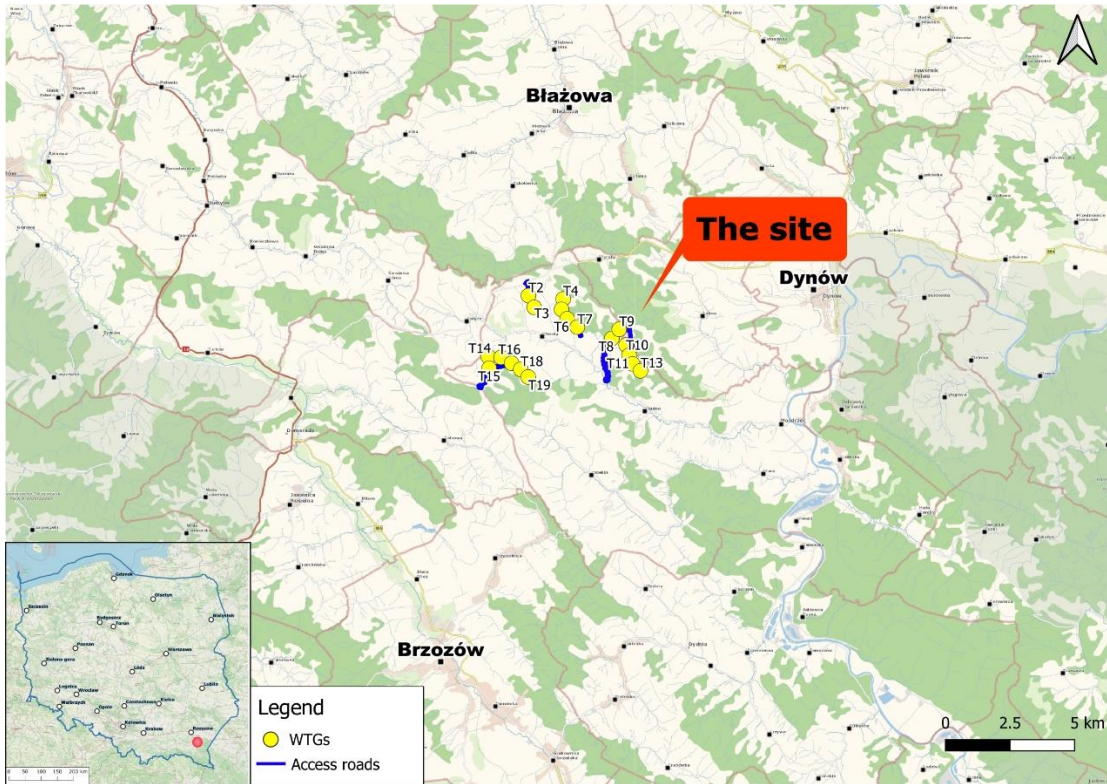


Figure 2. Project location

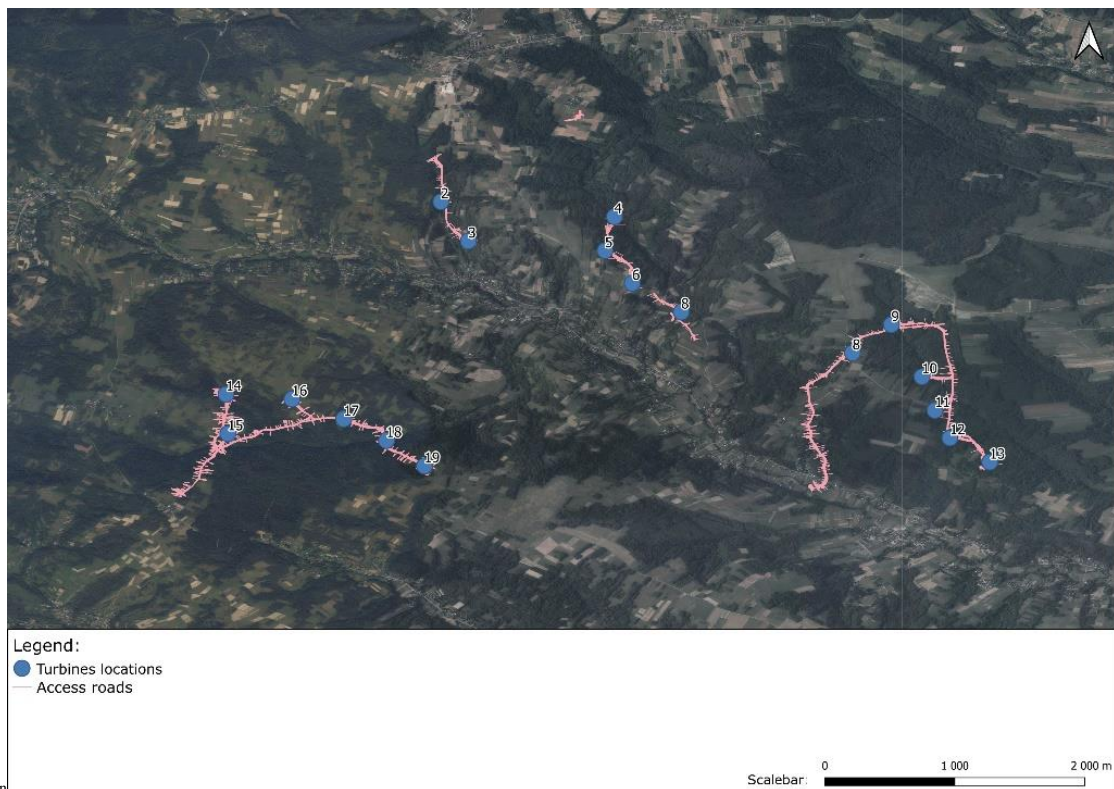


Figure 3. Project layout

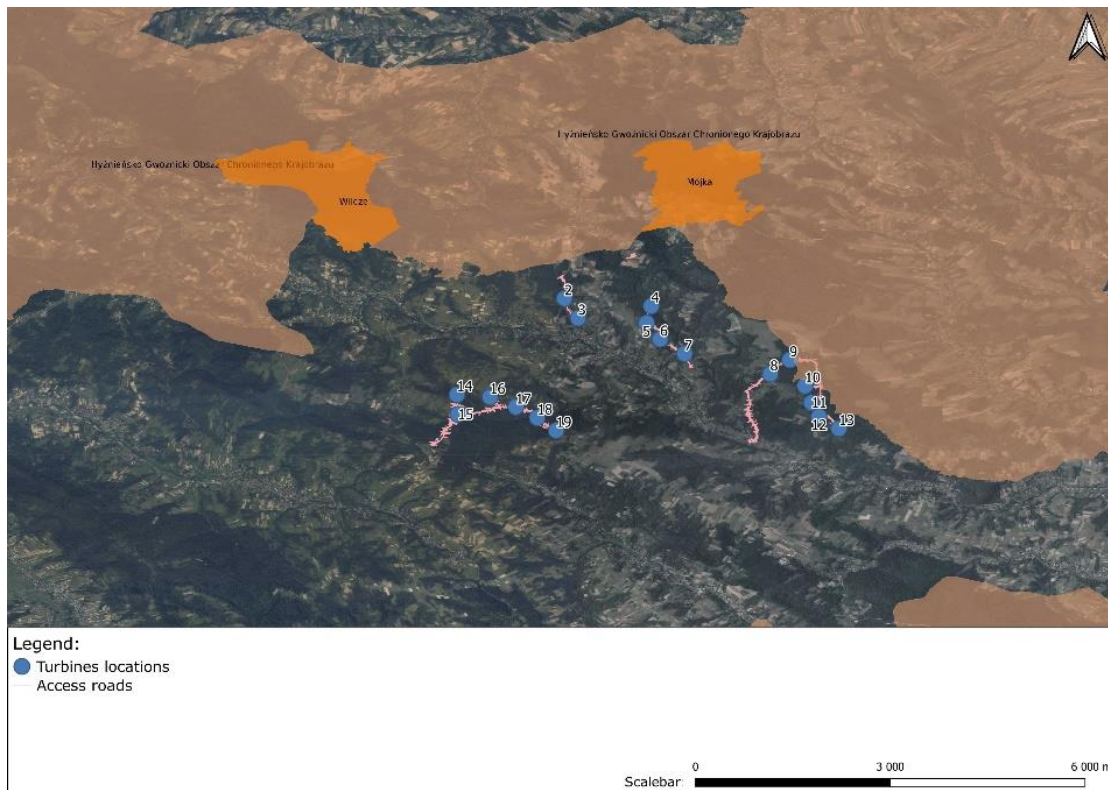


Figure 4. Project location against Natura 2000 areas

Legislative Context and Public Consultations

According to the Act of October 3, 2008 on disclosure on environmental information, public participation in environment protection and on environmental impact assessments¹, an Environmental Impact Assessment (EIA) procedure must be performed for projects which can always significantly impact the environment (group I projects) or may be performed, upon authorities discretion, for particular ones, which can potentially significantly impact the environment (group II projects). An EIA is carried out, among others, as a part of the administrative procedure for obtaining a decision on Environmental Conditions (environmental decision), which is obligatory for a realization of an individual project defined as likely to always/potentially have a significant impact on the environment.

In the administrative procedures for the Nozdrzec WF project, the Authorities, including Sanitary Inspectorate (Polish abbrev. SANEPID) and Regional Directorate for Environment Protection in Rzeszów, considered EIA report for the planned wind farm to be necessary. Such EIA report was prepared in 2011 by the Savona Project Sp. z o.o. company.

Information on the planned investment together with EIA Report were made available for comments of the public, including local communities and potential interested parties, such as nature protection bodies and ecological organizations. Announcement on Nozdrzec project was presented to the public in all villages, where the project would be conducted, as it is routine and accepted practice in the region. As required, environmental and sanitary authorities were informed about the investment to come up with any potential issues. In addition, the society of the communes has been notified on the planned investment through notifications published on the commune's notice boards.

¹ Ustawa o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko

After completion of all steps required by the environmental law, the Project was finally granted environmental decision. No. PPIGL.6730.2.1.2011, issued by the Head of Nozdrzec Commune on January 17, 2013. On March 21, 2013 due to lack of any appeals the decision become ultimate and valid.

The environmental decision imposed the following major obligations to the further Project development:

- The development shall not change groundwater conditions;
- Construction works shall be executed during day hours only (between 6 am and 10 pm);
- Acoustic properties of the WTGs shall be optimized in order to secure lack of noise standards at the acoustically protected areas;
- Groundworks and WTGs assembly works are allowed only out of the breeding season (i.e. between March 15 and July 15);
- Cure cost of injured birds during wind farm exploitation will be covered by the Company;
- On the access roads warning signs shall be placed in a distance of 200 m from the WTGs;
- Blades of WTGs shall be equipped with heating system or other anti-freezing installation;
- Rotational speed of WTGs shall be between 4 and 18 rotations per minute;
- In a year preceding the Project construction a birds monitoring in MPPL protocol shall be conducted at two plots in the period between April 10 and June 30;
- A post construction monitoring of birds shall be undertaken three times within the first five years of wind farm operations, adopting the same methodology used for the pre-development one and each campaign shall cover the whole year. Additionally carcass monitoring shall be performed. Results of the monitoring shall be summarized in a report, which shall analyze changes in space use by birds, in line with BACI (before-after/control-impact) and impact gradient analysis methodologies.
- A post construction monitoring of bats shall be undertaken three times within the first five years of WF of operation. The monitoring shall take place in the period between March 15 and November 15. Bats activity shall be monitored automatically with use of detectors of at least the same but preferably better parameters than of these used during pre-development monitoring. The detectors shall be installed at the hub height or at the lower range of the WTG's blades if required in order to secure appropriate quality of recording. The detectors may be installed at the WTGs or alternatively at standing alone towers. Two detectors shall be installed for WTGs No. 1-7, two detectors for WTGs 8-13 and two detectors for WTGs No. 14-19. Based on monitoring results assessment of the Project on shall be undertaken.
- A carcass monitoring of birds and bats shall be undertaken along with the monitoring of birds and bats behavior for at least 15 WTGs. The search shall cover an area of 220x220 m with WTG in its center. The monitoring shall include: a) search for carcasses; b) research of search effectiveness and c) research of carcasses disappearance speed. The decision provides detailed requirements with respect of these researches.

A post-construction noise measurements shall be undertaken during the first quarter after the wind farm is operational.

On the base of the environmental decision, the Company has been granted numerous building permits, which allows for construction of all Project elements.

What is the Current Condition of the Existing Environment?

Protected areas are neither present on the Project site nor the site is itself located on a protected area (e.g.: national park, landscape park reserve or Natura 200 area).

Based on publicly available maps on Geoserwis (<http://geoserwis.gdos.gov.pl>), the list of nearest identified nature protected areas, located up to 20 km around the Project site includes following:

- Natura 2000 protection areas:
 - “*Rzeka San*” PLH180007 - approximately 1.4 km to the east of the Project area;

- “Pogórze Przemyskie” PLB180001 – approximately 3.1 km to the southeast of the Project area;
- “Wisłok Środkowy z Dopływami” PLH180030 - approximately 6.7 km to the west of the Project area;
- “Kościół w Dydni” PLH180034 - approximately 10.1 km to the south of the Project area;
- “Nad Husowem” PLH180025 - approximately 12.7 km to the northeast of the Project area;
- ”Ostoja Czarnorzecka” PLH180027 - approximately 12.9 km to the southwest of the Project area;
- Nature Reserves:
 - “Mójka” - approximately 1.8 km to the north of the Project area;
 - “Wilcze” - approximately 2.7 km to the northwest of the Project area;
 - “Kozigarb” - approximately 10.6 km to the east of the Project area;
 - “Kretówki” - approximately 12.0 km to the southwest of the Project area;
 - “Brodzuszurki” - approximately 12.6 km to the east of the Project area;
 - “Cisy w Malinówce” - approximately 13.1 km to the southwest of the Project area;
- Landscape Protection Zones:
 - “Hyżnierńsko-Gwoźnicki” - approximately 0.4 km to the northwest of the Project area;
 - “Wschodniobeskidzki” - approximately 1.3 km to the east/southeast of the Project area;
 - “Czarnorzecki” - approximately 7.1 km to the southwest of the Project area;
- Landscape Parks:
 - “Pogórze Przemyskiego” - approximately 3.1 km to the east of the Project area;
 - “Czarnorzecko-Strzyżowski” - approximately 7.1 km to the west/southwest of the Project area;
- Ecological areas:
 - “Śnieżyczka przebiśnieg” - approximately 4.3 km to the southeast of the Project area;
 - Unnamed - approximately 11.5 km to the southeast of the Project area.

At an early stage of Project development a year-long birds monitoring was conducted at the site. The monitoring program was compliant with the national guidelines for assessment of wind farms for birds and included several day long series of ornithological observations. As confirmed by Ramboll the Polish guidelines are compliant with the international standards promoted by BirdLife International. Birds’ observations were conducted between December 20, 2008 and November 26, 2009. During the monitoring campaign 32 site observations were completed which covered all seasons of the year. Observations were collected at three transects, 4 km long each and at the observation points. The transects covered entire Project site.

At the area of the Nozdrzec WF, 84 bird species were identified, including 12 species from listed in the so-called Birds Directive, including 2 species from the Polish Animals Red Book (“*Polska Czerwona Księga Zwierząt*” Głowaciński, 2001), and including 24 species listed in SPEC (Species of European Conservation Concern, in categories: 1-3). However, the entire site was not assessed as of particular attractiveness for birds. Moreover, over 90% of observed birds flew at altitudes below a lower range of WTGs blades hence were not exposed to potential collisions.

There were also bats observations within the area of Nozdrzec WF site, commenced in July 2009 and completed in 2010. The first monitoring campaign was commenced on July 6 and completed on September 26, 2009. Within this period the observations were conducted 10 times. During the winter season search for bats hibernation places was conducted. The second monitoring campaign was commenced on March 13 and completed on July 1, 2010. This campaign included 15 observations in the field. Additionally, observations in the field were conducted also four times in November and October, 2010. A search for hibernating bats did not reveal presence of bat colonies hibernation places at the Project site. The bats monitoring was conducted according to national guidelines for assessment of wind farms impact on bats, which, as

confirmed by an Ramboll are compliant with international standards of EUROBATS. The Project site was assessed as of low attractiveness for bats. Only four bat species were identified by mean of voice detection both at transects and observation points. Their flight intensity was classified as low to moderate, the increased intensity occurred along large forest complexes.

Given the birds and bats monitoring was conducted over 10 years ago, an additional site evaluation was conducted in the period between July and August, 2022 by experienced ornithologists. The evaluation confirmed that the monitoring of 2009-2010 can still be assessed representative for the area, although some changes were noted. These were mainly caused by progressive natural succession on uncultivated land. Increased areas of young complexes of trees and bushes have made the site more attractive for breeding birds (which however are in majority not exposed to collision risk with WTGs) and slightly less attractive for birds of prey, although one to two observed lesser spotted eagle were suspected for breeding in this area, while such were not observed during the full-year monitoring program.

In 2009-2010 the Project site was also surveyed for presence of valuable habitats or species of flora, other than birds and bats fauna and fungi. The survey did not indicate any collisions of the Project elements with valuable habitats or species.

Will the Project be Safe for Environment and Societies?

The Project passed Environmental Impact Assessment (EIA) and in 2011 was granted environmental decision. The assessment of Project impacts was conducted by competent authorities based on an EIA report (the Report) prepared on request of the developer by an experienced environmental consulting company, as required by EU and national environmental regulations. The Report was then evaluated by Ramboll as for its accuracy and compliance with lenders requirements. The environmental and social aspects which were found as insufficiently or not at all presented in the report were assessed additionally by Ramboll.

What Impacts Will Occur During Construction?

The construction of Nozdrzec WF will last a few to several months and will generate mainly social impacts of different intensity depending on the construction phase.

The physical construction works will commence with preparation of access roads, foundations, laying of underground cables and others which in general can be characterized as ground works. The main impacts during this phase will be associated with increased traffic, generation of noise, vibrations and emissions to air. As estimated by Ramboll, transport of soil excavated for construction of roads and foundations, delivery of roads hardening materials, concrete, steel and other materials will require approximately 8-9 truck drives per hour in the period of approximately three months. Such increase traffic will affect mainly the local roads Nozdrzec – Barycz and Nozdrzec-Lubno, but also national roads No. 835 and 884. The nuisance for humans will be limited by mean of conducting the works during day hours only, unless technological purposes (e.g. laying of concrete for foundations) require operations around the clock. Before commencement of such works the Company will inform local societies about the increased risk of road accidents and related nuisances. The grievance mechanism implemented by the Company will secure that any excessive nuisance for the citizens will be properly addressed and if needed also compensated.

Following the provisions of environmental decision ground works shall be executed out of the birds breeding season, however, the Company intends to get approval of the competent authorities to conduct such works also during breeding season but under strict supervision of experienced ornithologist/natural scientists. Ramboll confirmed that such practice was successfully applied at other wind farm developments, without any negative impact to the wild nature.

Construction of the access roads and in particular exits from the public roads may require some trees and bushes clearance, which will be conducted out of the breeding season.

Other social impacts are predicted for the second phase of the construction works – erection of the WTGs. During this phase, heavy and large WTGs elements will be delivered to the site. Following the Polish regulations, oversize and heavy cargo can be transported during night hours only. Each WTG will be delivered at approximately 10 trucks, i.e. 180 trucks in total. Assuming that elements for a single WTG will be delivered at the time, 18 nights will be needed to deliver all of the WTGs. Such transport may be a nuisance for inhabitants due to noise and flashing lights. At exits from the public roads, which are however distant from most of the houses in the area, also jams may be formed. The Company will react to any grievances submitted by the inhabitants.

What Impacts will Occur During Operation?

Apart from the impacts on birds and bats, the operating wind farms are known to generate impacts related to noise, shadow flicker, a risk of ice/blade throw as well as change in the landscape and in some extent also electromagnetic fields.

Noise

The Report analyzed numerous configurations of the wind farm, both in terms of number and type, dimensions and sound power of potential WTGs. The analysis for WF configuration of 19 WTGs were conducted for the following WTG parameters:

- Hub height 105 m, sound power level 102.5 dB(A);
- Hub height 138 m, sound power level 102.5 dB(A);
- Hub height 108 m, sound power level 104 dB(A);
- Hub height 138 m, sound power level 104 dB(A), and
- Hub height 125 m, sound power level 104 dB(A).

In 2013 another noise distribution calculation was conducted for 18 WTGs with the following parameters: sound power level LWA = 104.5-106 dB; hub height HH = 120 m; rotor diameter 116.8 m). That modeling exercise included calculations of noise distribution at 25 reference points located at the acoustically protected areas. The calculations were made with use of the model (WindPro, ver. 2.8.579) compliant with the EU noise modelling standard. The results showed that for all receptor points the noise level would not exceed the permissible standard at night (45 dB(A)), hence operation of the Project is not likely to cause excessive noise impact at the human dwellings. It should be also emphasized that the model analyzes the worst case scenario, in which e.g. noise emission of a WTG is equal in all directions, while in the real conditions it differs depending on the orientation of the blades against the wind direction. Therefore it can be expected that the actual noise impact will be even less extensive than modelled. Further, the Nordex N117/3000 WTGs allow for work without any negative impact on productivity with noise emission between 103 and 105 dB(A) which will allow to adjust specific WTGs if any breach of noise standards is observed.

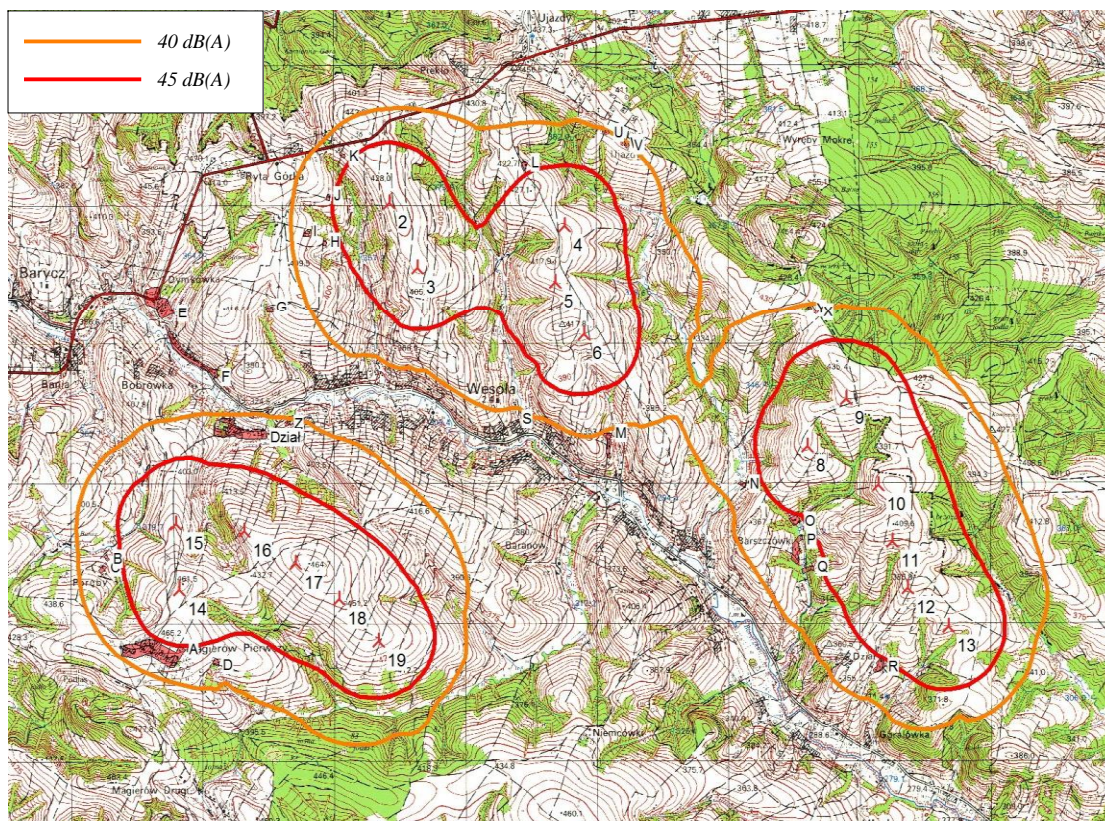


Figure 5. . Noise distribution at night around Nozdrzec WF (source: additional noise modeling, 2013)

Shadow Flicker

The rotating blades of the turbine may cause the shadow flicker effect. Polish law does not regulate in any way this effect. Therefore, any recommendations or restrictions associated with it cannot be applied to the investor. The applied guidelines are based on a document *Hinweise zur Ermittlung und Beurteilung der Optischen Immissionen von Windenergieanlagen (WEA-Schattenwurf-Hinweise)*, which is a basis for shadow flicker analysis in Germany. According to that document shading duration should not exceed 30 hours per calendar year and should be a maximum of 30 minutes per day. Although these values are not regulated by law, they are also used in many other European countries (eg. Great Britain, France, Netherlands).

On request of Ramboll a shadow flicker study was undertaken with use of WindPro software. The most pessimistic conditions were analyzed, i.e. without taking into account meteorological statistics. The results indicated that at 16 out of 26 checked locations the guidelines values may be exceeded. The maximum duration of shadow flicker is expected in the village of Wesola, where the shadow flicker may last as many as 140 hours per year and 121 minutes per day. It shall be noted, that in actual conditions duration of this effect shall be much shorter, since the model does not take into account meteorological statistics, such as presence of clouds or directional characteristics of the shadow (e.g. flicker will not occur if blades are parallel to sun rays direction). The Company is, however, aware of such potentially negative effect and will monitor it and will develop and implement appropriate compensation or mitigation measures if necessary.

Visual Impacts

The visual impacts of the Project were analyzed in the EIA report. The analysis indicated that WTGs will be visible in a range of 3 km and moderately visible in a range of 6 km around the Project site. Due to the topography, the height of the WTGs and their location mainly on tops of the hills will make construction visible from villages around the site.

The turbines which are currently regarded as visually intrusive to current rural landscape will form architectonic dominant objects in the environment. Nevertheless, it should be stressed that the evaluation of the influence of the WF on the landscape is difficult and always subjective and depends on the individual preferences.

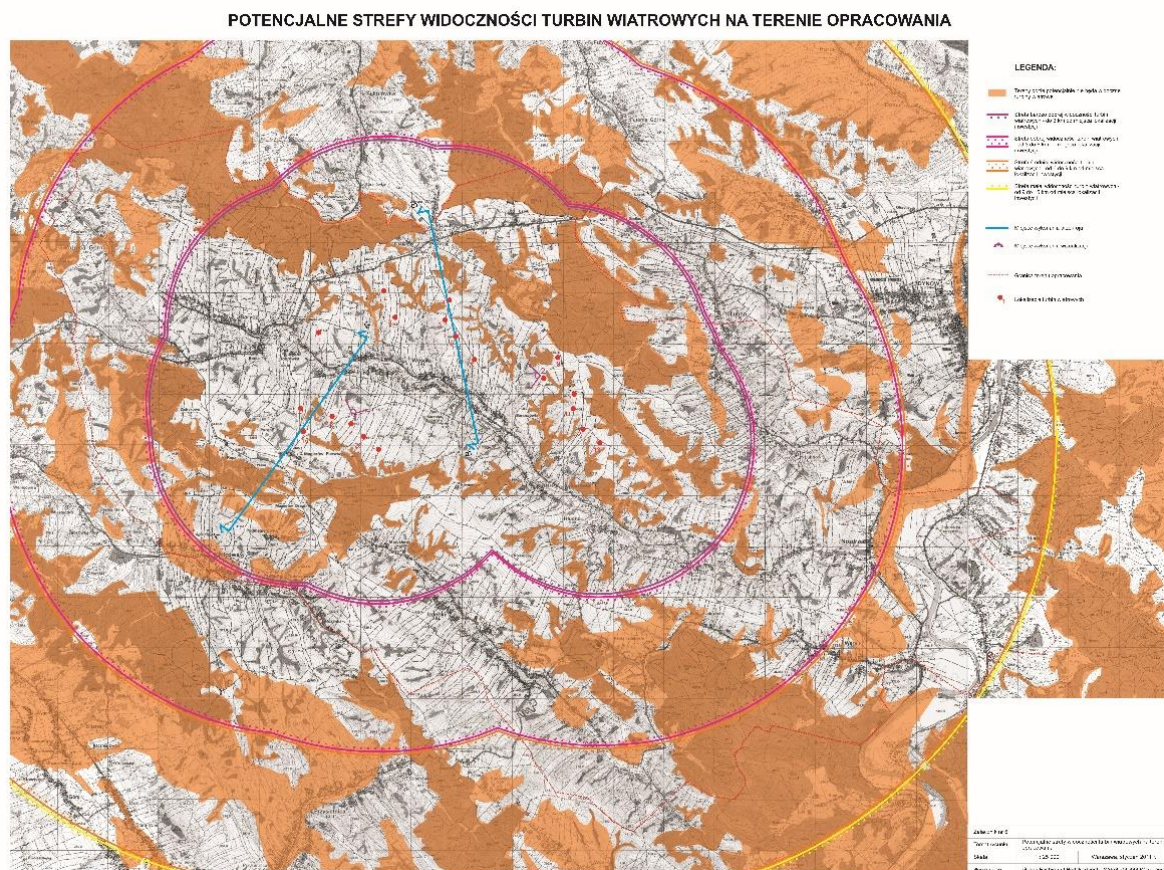


Figure 6. Predicted ranges of visual impact (source: EIA report)

Electric and Magnetic Fields

Polish regulations and technical standards very strictly define permissible values of electric magnetic fields in the environment. In case of the Project the main sources of electric and magnetic fields will be underground and overhead PTLs as well as MES. All these wind farm elements are distant from residential areas hence no negative impact of them is expected.

Ice and Blade Throw Risk

The effect of ice throw may occur when ice generated on the turbine blades under certain meteorological conditions is thrown away of the blade driven by a centrifugal force. The safe distance between WTGs and areas susceptible to such impact can be estimated according to the guidelines provided by the Wind Energy Production in Cold Climate (Wind Energy Production in Cold Climate Tammelin, Cavaliere, Holttinen, Hannele, Morgan, Seifert, and Sääntti, 1997), which suggest the following formula for calculating the safe distance: $1.5 * (\text{hub height} + \text{rotor diameter})$. Considering the chosen model of WTG (Nordex N117/3000 controlled, 3 MW), based on provided parameters, the rough calculations for the planned Nozdrzec WF indicate that for assumed hub height (131.6 m) and rotor diameter (116.8 m), the maximum ice throw range will be approximately 373 m. This risk, however, is very much limited since according to the environmental decision the WTGs should be equipped with a blade heating or anti-icing system, and warning signs on local roads at a distance of 200 m from the turbines shall be located. Please note that Nordex WTGs to be installed at the site offer system for automatic shut-down of WTGs in case of ice detection. Ramboll considers this option as rationale alternative to heating or other anti-freezing system, however, such option will be adopted only if approved by the competent authorities.

The blade or part of blade throw risk occurs in certain circumstances, e.g. if blade structure is affected by ice or manufacturing error, or, if an accident caused e.g. by fire or thunder strike occurs, while the blades are rotating. Damaged part of the blade or entire blade is then thrown away by a centrifugal force. Theoretically, the throw range can be calculated based on the kinematic of angular throw, which, for given WTGs, correspond to a maximum range of throw of some 1500 m. However, in real conditions the thrown blade or its part is still subject to aerodynamics forces and air resistance and actual distances of throw are typically shorter, which was proved both numerically and by observations of real accidents. Following presentation of Mr. Scott Larwood of California Wind Energy Collaborative presentation (2004 Forum Palm Springs), a throw range for near 100 m tall WTGs is approximately equal to WTG overall height for entire blade, and 2.5 times WTG height for part of it. In lack of the sound scientific background Ramboll has assumed, that the blade throw range for the selected WTGs will be 330 m, hence will not reach the nearest dwellings (450 m).

Birds and Bats

Following the common understanding of wind farm impacts, Nozdrzec WF may create a threat to birds and bats. Nevertheless, it should be pointed that number of observations and reports on active wind farms and its impact on birds' populations indicate that birds avoid collisions with wind farms. The number of bird casualties resulting from collisions with wind turbines is significantly smaller than those caused by collisions with e.g. cars, power lines and houses.

To recognize the local birds' populations and undertake applicable measures during the planning stage, the Company conducted a number of ornithological observations at the planned wind farm site.

Collisions of birds with the new objects, including wind turbines, may occur, especially at night, with weather conditions resulting with a limited visibility. However, observations from existing wind farms show that those would be very isolated incidents and would not have a significant effect on local bird populations. Since the Nozdrzec WF is not on a migration route and is not an important breeding ground for protected species, it is therefore expected that collisions may only occur incidentally and will not have a significant effect on the populations. Nevertheless, post-construction bird monitoring has been required.

In line with the national and EUROBATS guidelines (dealing with impact of wind farms on bats) the identified species of bats belongs to a group with high risk of collision with wind turbines. However, taking into account the spatial distribution of wind turbines and areas where bats were observed, it was concluded that the already low risk may be further reduced by location of the turbines in the appropriate distance from forested areas and borders of residential areas. Nevertheless, post-construction bats monitoring has been required and this has been included within an Environmental and Social Action Plan developed for the Project

Will the Impacts be Somehow Limited?

The main measure, which may be used to prevent significant environmental impact of a wind farm, is a good choice of the location. Thus, during the project preparation a number of possibilities of different locations of wind turbines have been analyzed. During preparation of the variants of the investment, apart from technological and economic issues (such as winds characteristics and costs of land lease and use), have been taken into account the following issues, important from the perspective of environmental protection:

- existing state and way of land development and use of areas, which includes distribution of residential housing, forests, farming land,
- mutual impact on individual objects on each other, including also possible adding up of sound waves,
- necessity of protecting the objects of residential housing against noise,
- location from the perspective of birds and bats protection.

The second aspect of choice, very important from the point of view of environmental protection, was the choice of a producer and a supplier of equipment. The Company selected a reputable German manufacturer of WTGs – Nordex, who represents the highest quality modern equipment. Only brand new WTGs will be installed at the site.

Through the detailed analysis of all environmental, social and economical constraints the number of WTGs was limited from initially considered 40 to 18. The current lay-out secures that:

- The binding environmental noise quality standards, set in Executive Order of the Minister of Environment² will not be exceeded;
- The WTGs are located out of birds migration routes, birds concentrations, feeding or nesting areas, and do not disturb ecological corridors;
- The Project is located out of valuable habitats, wetlands or forest areas;
- The Project is located out of nature (such as Natura 2000) and landscape protected areas and will not affect neither subject of protection nor integrity of such areas, and
- The Project is located out of the areas valuable from the cultural landscape point of view.

Will the Wind Farm be Monitored?

The environmental decision imposes a certain obligations on the Company with respect to post-construction monitoring of generated impacts. Moreover, the Company intends to voluntarily expand the required monitoring program in order to properly address any environmental or social issues which may occur during the wind farm exploitation.

Noise

According to the Environmental Protection Act and based on requirements of the environmental decision, the Company is obliged to conduct post construction noise level measurements for the wind farm. The first noise measurements should be conducted two months after project start-up. If the measurements indicate that permissible noise levels are exceeded, noise reducing action will be necessary to be completed (i.e. reduction of the acoustic power of the subject wind turbine(s)), followed by the second round of measurements for confirmation that noise permissible levels are not exceeded.

Birds

The environmental decision requests that a post-construction monitoring of birds is conducted after the wind farm is fully operational. The monitoring shall be conducted in three year-long periods during the first five years of wind farm operations.

The birds monitoring methodology shall reflect the methodology applied for the pre-construction monitoring, i.e. both transect and point observations should be collected from all phenological seasons. Birds number, species and behavior in the wind farm area shall be noted and analyzed. Moreover, carcasses monitoring shall be undertaken, including not only

² Executive order of June 14, 2007 on permissible noise levels in the environment. Unified text in JoL of 2014, item 112

identification of collisions with WTGs victims, but also assessment of the carcasses monitoring effectiveness. The monitoring results shall be reported to competent and environmental authorities and, if needed, a plan for reduction of the impact on birds shall be developed and implemented.

Bats

Bats monitoring is also required for the Project to be implemented after the wind farm is operational. The monitoring shall be conducted in three year-long campaigns within the first five years of the Project being operational. Automatic bats activity recording is required by environmental decision. Automatic bats voice recording will be conducted at two points representative for each of three groups of WTGs. Apart from that the Company intends to undertake voluntarily additional bats monitoring compliant with the guidelines for assessment of wind farms impact on birds, i.e. classical recording of bats voices collected from transects and observation points.

The automatic and classic monitoring of bats will be supported by carcasses monitoring as requested by the environmental decision. Similarly to carcasses monitoring of birds, the one conducted for bats will include not only counting of fatalities but also assessment of carcasses monitoring effectiveness.

Given the site faces progressive natural succession which may change bats behavior, the Company is committed to take any actions necessary to reduce a potential impact on bats. The results of the bats monitoring during the first two years will be used for development of a mitigation program for the next years of the wind farm operations, which may include even turning some WTGs off during certain meteorological conditions and for specific hours before sunrise and sunset.

Monitoring of Social Impacts

The Company will implement a grievance procedure for all interested stakeholders, including local societies. The submitted grievances will be processed by the Company without any delay.

The grievances related to social impacts, such as but not limited to:

- Occurrence of shadow flicker,
- Excessive noise during construction or operation, and
- Other environmental or social nuisances

will be of primary importance for the Company. Each submitted grievance will be investigated and appropriate mitigation or compensation measures will be agreed with the submitter and then implemented.

Monitoring by the Lenders

The Project is being financed by international banks and financing organizations, which require that the certain best industry practices are in place. The Company is required to report its environmental and social performance to the lenders on annual basis and periodically to be audited by an independent environmental and social consultant. Should any issues are identified by the lenders, the Company will be obliged to implement appropriate mitigation or compensation measures.

Can I Get More Information About the Project or Report My Concern?

The Company intends to follow the best industry practice with respect to stakeholder engagement and meaningful consultations with the affected parties. Therefore all Project-related information is available on the Project-dedicated website at www.farma-nozdrzec.pl and at the Company local office in Hłudno 89/1, 36-245 Hłudno. Any additional information about the Project is available there.

The Company has implemented a grievance mechanism. A grievance form is available at the Project-dedicated website, company local office in Hłudno and in the Commune Office in Nozdrzec.

For more information about the Project, expected environmental or social impacts, Project development status and other issues please contact:

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